***DRAFT***
**INITIAL LICENSE**

**UTAH DEPARTMENT OF ENVIRONMENTAL QUALITY**
**DIVISION OF RADIATION CONTROL**
**RADIOACTIVE MATERIAL LICENSE**
**for**
**CONTAINERIZED LOW-LEVEL RADIOACTIVE WASTE DISPOSAL**

Pursuant to Utah Code Annotated, Title 19, Chapter 3 and the Utah Radiation Control Rules, Utah Administrative Code (UAC) R313, and in reliance on statements and representations heretofore made by the Licensee designated below, a license is hereby issued authorizing the Licensee to transfer, receive, possess, and use the radioactive material designated below; and to use radioactive material for the purpose(s) and at the place(s) designated below. The license is subject to all applicable rules, and orders now or hereafter in effect and to all conditions specified below.

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| | | | |
|---|---|---|---|
| | Licensee | 3. | License Number UT _____<br>Amendment # _____ |
| 1. Name | Envirocare of Utah, Inc. | | |
| 2. Address | 46 West Broadway<br>Suite 116<br>Salt Lake City, UT 84101 | 4. | Expiration Date<br>_____ |
| | | 5. | License Category: 4a |

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| 6. Radioactive Material (element and mass number) | 7. Chemical and/or physical form | 8. Maximum Quantity |
|---|---|---|
| A. Any radioactive material, excluding source material and special nuclear material. | A. Dry packaged radioactive waste except as authorized by this license. | A. 60,000 curies ($2.22 \times 10^{15}$ Bequerels). |
| B. Source Material | B. Dry packaged radioactive waste except as authorized by this license. | B. 79,000 pounds (36,000 kilograms) |
| C. Special Nuclear Material. | C. Dry packaged radioactive waste an check sources of exempt quantities, except as authorized by this license. | C. 350 grams of U235 or 200 grams U233 or 200 grams of plutonium or any combination of these, provided the sum of the ratios of the quantities does not exceed unity. |

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**AUTHORIZED USE**

9. Licensee may receive, store, and dispose by near-surface land disposal, containerized low-level radioactive waste (LLRW) as defined in Conditions 6, 7, and 8. Prior to receiving any LLRW shipment for disposal, the Licensee shall demonstrate to the Executive Secretary that the LLRW to be received have been approved for export to the Licensee. Export approval is required from the LLRW compact of origin (including the Northwest Compact), or for states unaffiliated with a LLRW compact, the state of origin, to the extent a state can exercise such approval.

10. The Licensee shall comply with all applicable portions of the Utah Radiation Control Rules, Utah Administrative Code (UAC) Chapter R313-25, "License Requirements for Land Disposal of Radioactive Waste -- General Provisions."

11. The Licensee shall fulfill and maintain compliance with all conditions and shall meet all compliance schedules stipulated in the Ground Water Discharge Permit, number UGW 450005, issued by the Executive Secretary of the Utah Water Quality Board

**SITE LOCATION**

12. The Licensee shall receive, store and dispose of licensed material only at the Licensee's facility located in Section 32 of Township 1 South and Range 11 West, Tooele County, Utah.

13. The Containerized LLRW Disposal Embankment is defined by the area enclosed by the following points of reference:

| Location | Latitude | Longitude |
|---|---|---|
| Northwest corner | 40E 41' 39.421559" | 113E 7' 24.571119" |
| Southwest corner | 40E 41' 29.468818" | 113E 7' 24.799486" |
| Southeast corner | 40E 41' 29.063309" | 113E 6' 54.357427" |
| Northeast corner | 40E 41' 39.015995" | 113E 6' 54.129068" |

14. Pursuant to UAC R313-12-55(1), the Licensee is granted an exemption to UAC R313-25-9, as it relates to land ownership and assumption of ownership.

*NOTE: Condition 14 is subject to final action of the Utah Board of Radiation Control.*

**SPECIAL NUCLEAR MATERIAL**

15. Consistent with the definition of special nuclear materials given in UAC R313-12-3, the maximum quantity of special nuclear material the Licensee may possess at any one time shall be 200 grams of uranium-233, 350 grams of uranium-235, and 200 grams of plutonium, or any combination of these as long as the following formula is not violated:

$$\frac{\text{Grams of uranium-233}}{200} + \frac{\text{Grams of uranium-235}}{350} + \frac{\text{Grams of plutonium}}{200} \# 1.0$$

**MIXED WASTE**

16. The Licensee shall not dispose of any radioactive waste in the Containerized LLRW Disposal Embankment that is also determined to be hazardous waste (commonly referred to as mixed LLRW). Mixed LLRW is defined as waste that satisfies the definition of low-level radioactive waste specified in the Low-Level Radioactive Waste Policy Amendments Act of 1985 (P.L. 99-240), and contains waste that either (1) is listed as hazardous waste in Subpart D, 40 CFR 261, or (2) causes the waste to exhibit any of the hazardous waste characteristics identified in Subpart C, 40 CFR Part 261.

**PROHIBITIONS AND WASTE REQUIREMENTS**

17. In accordance with UAC R313-15-1008(2)(a)(ii), solid waste received for disposal in the Containerized LLRW Disposal Embankment shall not be packaged in cardboard or fiberboard containers. Except as otherwise provided in this License, all LLRW to be disposed of in the Containerized LLRW Disposal Embankment shall be received and disposed of in closed containers.

18. Receipt of liquid radioactive waste is prohibited. Notwithstanding this prohibition and in accordance with UAC R313-15-1008(2)(a)(iii), liquid waste may be received for disposal in the Containerized LLRW Disposal Embankment provided the waste is packaged according to the following specifications:

    - A metal outer disposal container is used which meets DOT 7A performance specifications and heavy-duty closure devices.
    - The metal container is lined with a minimum of a 4 mil plastic liner approved by the Division.
    - The liquid is contained in enough sorbent material to sorb at least twice the volume of the liquid contents.
    - Only sorbents approved by the Division shall be used.
    - A quality control program is used which verifies that the above conditions are met.

19. In accordance with UAC R313-15-1008(2)(a)(iv), solid waste received for disposal in the Containerized LLRW Disposal Embankment shall contain as little free-standing and non-corrosive liquid as reasonably achievable, but shall contain no more free liquids than one percent of the volume of the waste. Verification of liquid content shall be accomplished in accordance with the revision of the Licensee's "LLRW Operations Manual" currently approved by the Division or other operating procedures approved by the Division.

20. In accordance with UAC R313-15-1008(2)(a)(v), waste received for disposal in the Containerized LLRW Disposal Embankment shall not be readily capable of detonation or of explosive decomposition or reaction at normal pressures and temperatures, or of explosive reaction with water.

21. In accordance with UAC R313-15-1008(2)(a)(vi), waste received for disposal in the Containerized LLRW Disposal Embankment shall not contain, or be capable of generating, quantities of toxic gases, vapors, or fumes harmful to persons transporting, handling, or disposing of the waste.

22. In accordance with UAC R313-15-1008(2)(a)(vii), waste received for disposal in the Containerized LLRW Disposal Embankment shall not be pyrophoric.

23. In accordance with UAC R313-15-1008(2)(a)(vii), gaseous waste received for disposal in the Containerized LLRW Disposal Embankment shall be packaged at an absolute pressure that does not exceed 1.5 atmospheres at a temperature of 20 degrees Celsius and the total activity of any container shall not exceed 100 curies ($3.7 \times 10^{12}$ Bequerels).

24. In accordance with UAC R31315-1008(2)(a)(ix) waste received for disposal in the Containerized LLRW Disposal Embankment shall not contain untreated biological, pathogenic, or infectious material including radiologically contaminated laboratory research animals.

25. The Licensee shall not accept for disposal any neutron source (e.g., polonium 210, americium 241, radium 226 in combination with beryllium or other target).

26. Incinerator ash shall be solidified, granular, or treated in a manner that renders it, exclusive of packaging, non-dispersible in air.

27. Solidified or stabilized LLRW containing chelating agents in excess of 0.1 percent by weight shall be sufficiently separated from other LLRW in the embankment that any interaction between this waste and other LLRW will not affect the radionuclide mobility of the other LLRW. Unless engineering studies approved by the Division justify otherwise, the minimum separation distance shall be 10 feet.

28. The cumulative void space within containers of Class A Unstable LLRW disposed of within the Containerized LLRW Disposal Embankment shall be less than one percent of the cumulative volume of Unstable Class A LLRW disposed of. The void space within any individual container shall not exceed five percent of that container's volume, unless specifically authorized by the Division of Radiation Control. The Licensee shall require and retain documentation from brokers and/or generators, together with a cumulative tabulation of Unstable Class A volumes disposed of in the Containerized LLRW Disposal Embankment and cumulative voids associated with that waste to demonstrate that the cumulative void space condition is satisfied on an annual basis.

29. All ion exchange resins, regardless of waste class, shall be solidified using solidification agents approved by the Division or shall be packaged in high integrity containers approved by the Division.

30. The Licensee shall not accept radioactive waste unless each waste package has been:

- Classified in accordance with UAC R313-15-1008(1) and the most recent version of the "Low-Level Waste Licensing Branch Technical Position on Radioactive Waste Classification," originally issued May 1983 by the U.S. Nuclear Regulatory Commission.
- Marked as either Class A stable, Class A unstable, Class B, or Class C, as defined the most recent version of the "Low-Level Waste Licensing Branch Technical Position on Radioactive Waste Classification," originally issued May 1983 by the U.S. Nuclear Regulatory Commission.
- Marked with a unique package identification number, clearly visible on the package, that can be correlated with the manifest for the waste shipment in which the package arrives at the facility.
- Stabilized, when required under the conditions of this license, in accordance with criteria contained in the most recent version of the "Technical Position on Waste Forms," originally issued May 1983 by the U.S. Nuclear Regulatory Commission, and procedures that are described in approved vendor topical reports. Only those stabilization media approved by the Division of Radiation Control or High Integrity Containers approved by the Division of Radiation Control may be used.
- Properly manifested in compliance with the requirements of UAC R313-15-1006 and UAC R313-25-33(8).

**MANIFEST/SHIPPING REQUIREMENTS**

31. The Licensee shall not accept containerized LLRW for disposal unless the Licensee has received from the shipper a completed manifest that complies with UAC R313-15-1006 and UAC R313-25-33(8). The Licensee shall also require that the manifest include the quantities of berkelium-247, calcium-41, californium-249, and chlorine-36 in order to comply with License Condition 36**.**

32. The Licensee shall maintain copies of complete manifests or equivalent documentation until the Executive Secretary authorizes their disposition.

33. The Licensee shall acknowledge receipt of the waste within one (1) week of waste receipt by returning a signed copy of the manifest or equivalent document to the shipper. The shipper to be notified is the Licensee who last possessed the waste and transferred the waste to the Licensee. The returned copy of the manifest or equivalent documentation shall indicate any discrepancies between materials listed on the manifest and materials received.

34. The Licensee shall notify the shipper (e.g., the generator, the collector, or processor) and the Division of Radiation Control when any shipment or part of a shipment has not arrived within 60 days after the advance manifest was received.

35. Licensee shall maintain a record for each shipment and container of LLRW disposed of at the site. At a minimum, the record shall include:

- Date on which the container was disposed of
- Location of the container in the Containerized LLRW Disposal Embankment;
- Condition of the waste packages received;
- Quantities of berkelium-247, calcium-41, californium-249, and chlorine-36 in each container
- Void space in each container.
- Any discrepancy between the waste listed on the shipment manifest or shipping papers and the waste received in the shipment;
- Description of any evidence of leaking or damaged packages or radiation or contamination in excess of applicable regulatory limits; and
- Description of any repackaging of wastes in any shipment.

**RADIATION SAFETY**

36. The Licensee shall comply with the provisions of UAC R313-18, "Notices, Instructions and Reports to Workers by License or Registrants, Inspections" and UAC R313-15, "Standards for Protection Against Radiation."

37. The Licensee may transport licensed material or deliver licensed material to a carrier for transport in accordance with the provisions of UAC R313-19-100, "Transportation."

38. The Licensee shall maintain written procedures and make such procedures available at the site location described in Conditions 12 and 13. The procedures shall incorporate operating instructions and appropriate safety precautions for the work. The employee training program shall include detailed review of the operating procedures applicable to the employee's assignments. The requirement for written procedures shall include establishment of procedures for conduct of the radiation safety and environmental monitoring programs, including analytical procedures and instrument calibration requirements. The Licensee's Corporate LLRW Radiation Safety Officer shall review and approve written procedures and subsequent changes to the procedures. At least annually, the Licensee shall review all procedures to determine their continued applicability.

39. The Corporation LLRW Radiation Safety Officer or other qualified individual designated be the Corporate LLRW Radiation Safety Officer shall perform and document weekly inspections of the facility. Items for inspection, at a minimum, include compliance with operating procedures, compliance with license conditions, and adequacy of safety practices.

40. Except while waste packages are being handled in the active areas of the Containerized LLRW Disposal Embankment, external gamma radiation levels shall not exceed 40 mR/hr at 1 meter from the surface of any emplaced waste package or concrete overpack. Measurements 1 meter from exposed surfaces and other appropriate locations shall be made and recorded daily. Reports summarizing and providing copies of these measurements shall be submitted biweekly to the Executive Secretary.

41. The weekly average external gamma radiation levels at the perimeter of the Containerized LLRW Disposal Embankment restricted areas shall not exceed 15 microR/hr.

42. Before receiving any package whose external gamma radiation at the surface exceeds 20 R/hr, a practice run of the disposal operation shall be performed using:

- Identical package of non-radiological material with similar physical characteristics;
- Equipment identical to the equipment that will be used during actual disposal of the waste package; and
- Personnel who will participate in the receipt, processing, handling, and disposal of the actual package.

The Licensee shall provide to the Division, before the practice run, the details of its projections of the individual occupational radiation doses to be received during actual handling of the waste for which the practice run is conducted. The detail provided shall include (1) estimates of the radiation dose rates (from the package being handled and from active embankment working faces at strategic locations during the disposal process and the (2) times and distances (from the waste package being handled and active embankment working faces) at which each person will be located during the disposal process.

43. The Licensee shall notify the Division of Radiation Control 48 hours in advance of the practice run described in Condition 43.

44. The Licensee shall notify in writing the Executive Secretary at the earliest possible date, but no later than 15 days before each shipment containing Class B and/or C packages or with contact radiation levels in excess of 200 R/hr. The notification shall include the anticipated dates of receipt and plans for disposal in the Containerized LLRW embankment.

45. The Corporate LLRW Radiation Safety Officer or his superior shall be present for and shall observe the receipt, processing, handling, and disposal of each waste package containing Class B and/or C waste or with contact radiation levels in excess of 200 R/hr.

**ROUTINE MONITORING AND CONTAMINATION SURVEYS**

46. The Licensee shall conduct contamination surveys in accordance with the following table:

| Type | Location | Frequency |
|---|---|---|
| A. Gamma Radiation Levels | 1. Perimeter of Restricted Area(s) | 1. Weekly |
| | 2. Office Area (s) | 2. Weekly |
| | 3. Lunch/Change Area(s) | 3. Weekly |
| | 4. Transport Vehicles | 4. Upon vehicle arrival at site and before departure. |
| B. Contamination Wipes | 1. Eating Area(s)<br>2. Change Area(s) | 1. Weekly<br>2. Weekly |
| | 3. Office Areas(s) | 3. Weekly |
| | 4. Equipment/Vehicles | 4. Once before release |
| C. Employee/Personnel | 1. Skin & Personal clothing | 1. Prior to exiting controlled area |
| D. Gamma Exposure | 1. Administration Bldg.(s) | 1. Quarterly |

47. The Licensee shall determine internal exposure of employees under its bioassay program, in accordance with UAC R313-15-204.

48. The Licensee shall implement a respiratory protection program that is in accordance with UAC R313-15-703.

49. The Licensee shall calibrate air sampling equipment at intervals not to exceed six months.

50. The operational environmental monitoring program capable of detecting the potential contribution of radioactive material and hazardous constituents from the site to the environment shall be conducted in accordance with Revision 0 of the Licensee's "LLRW/MW Environmental Monitoring Program," dated November 13, 2000, included as Appendix P of the Application for License Amendment, or subsequent revisions as approved by the Division..

51. Vehicles, containers, facilities, materials, equipment or other items, except conveyances (as defined in UAC R313-19-4) used for commercial transport of radioactive waste, shall not be released from the Licensee's control if contamination exceeds the limits found in Table 51-A.

**TABLE 51-A**

| Nuclide [a] | Column I Average [b,c,f] | Column II Maximum [b,d,f] | Column III Removable [b,e,f] |
|---|---|---|---|
| U-nat, U-235, U-238, and associated decay products | 5,000 dpm alpha/ 100cm$^2$ | 15,000 dpm alpha/ 100cm$^2$ | 1,000 dpm alpha/ 100cm$^2$ |
| Transuranics, Ra-226, Ra-228, Th-230, Th-228, Pa-231, Ac-227, I-125, I-129 | 100 dpm/100cm$^2$ | 300 dpm/100cm$^2$ | 20 dpm/100cm$^2$ |
| Th-nat, Th-232, Sr-90, Ra-223, Ra-224, U-232, I-126, I-131, I-133 | 1,000 dpm/100cm$^2$ | 3,000 dpm/100cm$^2$ | 200 dpm/100cm$^2$ |
| Beta-gamma emitters (nuclides with decay modes other than alpha emissions or spontaneous fission) except Sr-90 and other noted above. | 5,000 dpm beta, gamma/100cm$^2$ | 15,000 dpm beta-gamma/100cm$^2$ | 1,000 dpm beta-gamma/100cm$^2$ |

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a. Where surface contamination on both alpha-and beta-gamma emitting nuclides exists, the limits established for alpha-and beta-gamma emitting nuclides should apply independently.
b. As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.
c. Measurements of average contamination should not be averaged over more than one square meter. For objects of less surface area, the average should be derived for each such object.
d. The maximum contamination level applies to an area of not more than 100 cm$^2$.
e. The amount of removable radioactive material per 100 cm$^2$ of surface area should be determined by wiping the area with dry filter or soft absorbent paper, applying moderate pressure, and assessing the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. When removable contamination on objects of less surface area is determined, the pertinent levels should be reduced proportionally and the entire surface should be wiped.
f. The average and maximum radiation levels associated with surface contamination resulting from beta-gamma emitters shall not exceed 0.2 mrad/hr at 1 cm and 1.0 mrad/hr at 1 cm, respectively, measured through not more than 7 milligrams per square centimeter of total absorber.

**REPORTING**

52. The Licensee shall submit the following reports to the Executive Secretary:

- An annual summary of the volume of Unstable Class A, Stable Class A, Class B, and Class C LLRW, the associated radioactive inventories of each radioisotope, and the total void space (as documented and tabulated under Condition 29) disposed of in the Containerized LLRW Disposal Embankment by March 31st of each year for the preceding year.
- A semi-annual Physical Inspection Report. The report shall document the results of monthly physical inspections of the Containerized LLRW Disposal Embankment, the active LLRW disposal area(s), and constructed portions of the cover system. The report shall address findings related to condition and function of drainage components, observed erosion, settlement, differential settlement, and surface water management.
- A monthly disposal report of containerized LLRW disposed of including the volume received and disposed of by waste class. The report shall included information on the Class of volume and radionuclide activity of containerized Unstable Class A, Stable Class A, Class B, and Class C waste disposed (aggregated and total by generator), type and physical form of the waste, container type, and chemical form of the waste and solidification agent(s) used, where applicable. The monthly report shall be submitted within 30 days from the end of the preceding month.
- For the side slope areas of the Containerized LLRW Disposal Embankment, the Licensee shall ensure that the maximum activities of berkelium-247, calcium-41, californium-249 , and chlorine-36 do not exceed the values assumed in groundwater performance modeling at any time prior to facility closure. The Licensee shall notify the Executive Secretary, at the earliest opportunity, of any shipment of LLRW containing these radionuclides scheduled for delivery to the facility.
- For all areas of the Containerized LLRW Disposal Embankment, the Licensee shall ensure that the actual concentration of disposed chlorine-36 does not exceed 0.44 picocuries per gram in accordance with the following formula:

$$\frac{\text{Total Activity of Chlorine-36 Received(pCi)}}{\text{Total Mass of Active Cell}} \quad \# \quad \text{0.44 picocuries per gram}$$

53. Except as provided by this Condition, the Licensee shall maintain the results of sampling, analyses, surveys, and instrument calibration, reports on inspections and audits, employee training records, as well as any related reviews, investigations and corrective actions, for five (5) years. The Licensee shall maintain personnel exposure records in accordance with UAC R313-15-201.

54. The Licensee shall establish and maintain a database of disposed LLRW information, that tracks individual container data, including the void space fraction reported by brokers and/or generators for each Class A Unstable waste container disposed of in the Containerized LLRW Embankment.

## STAFFING/QUALIFICATIONS

55. A Radiation Safety Program shall be conducted by or under the supervision of Mark Ledoux, Corporate LLRW Radiation Safety Officer, or other individual, who has successfully completed the Licensee's training program and who has been designated by the Corporate LLRW Radiation Safety Officer.

56. The Licensee's staff shall complete the training program described in Section 7.4.3 of the Application for License Amendment and other specialized training appropriate to the functions each person performs.

## CONSTRUCTION ACTIVITIES

57. The Licensee shall obtain prior written approval from the Executive Secretary prior to construction of significant facilities. Significant facilities shall include, but are not limited to the Containerized LLRW Disposal Embankment, storm water- and wastewater- related handling, waste storage projects, and transfer projects.

58. The Licensee shall construct the Containerized LLRW Disposal Embankment identified in License Condition 10E in accordance with LLRW Embankment Construction Project Plan; other descriptions, specifications, and procedures contained in the Application for License Amendment dated December 13, 2000 or subsequent revisions approved by the Division; and approved engineering design drawings "Series D-99150-CV-0XX."

59. The Licensee shall construct the clay liner or radon barrier in accordance with the test pad procedures that have been approved by the Executive Secretary. The construction of testing of any clay liner or radon barrier shall be performed using the same methods and equipment used on the test pad construction and testing.

60. The Licensee shall construct and test a test pad for the clay liner or radon barrier whenever there is a change in any of the following:

    - Liner or radon barrier specifications,
    - Unified Soil Classification,
    - Construction procedures,
    - Construction equipment,
    - Construction supervisory personnel,
    - Material testing and procedures, or
    - When more than a year has passed since the last placement of clay liner or radon barrier.

    The Licensee shall notify the Division of Radiation Control (DRC) 48 hours in advance of commencing to construct and test a test pad. The Licensee shall provide a report to Executive Secretary, for review and approval, detailing the successful test pad results prior to implementing changes in any clay liner or radon barrier construction. This report shall be certified by a Utah registered professional engineer.

61. The Licensee shall place a "sacrificial soil" (freeze/thaw barrier) in accordance with the most recently approved Drawing Number D-99150-CV-017. The sacrificial soil layer shall have a residual water content of at least 3.5 weight percent and the following gradation:

    - D100 # 3/4 inch
    - D60 # 3/8 inch
    - D35 # No. 4 Sieve (4.75 mm)
    - D15 # No. 200 Sieve (-0.075 mm)

    The Licensee shall perform residual water content testing using ASTM methods D-3152 (at 15 ATM) and D-2325 and gradation testing using ASTM method C-136 at a range of one test per 2000 cubic feet. The Licensee may conduct a study demonstrating that at certain specified gradation, the minimum residual water content specification of 3.5 percent by weight will always be maintained. Testing procedures may be changed to gradation testing and rates specified in the currently approved CQA/QC manual upon approval of the Licensee's demonstration study by the Executive Secretary.

62. The Licensee shall not receive or dispose of containerized LLRW until the Division has inspected the Containerized LLRW Disposal Embankment and relate facilities, has found them to conform with the description, design, and construction described in the Application for License Amendment and has provided written authorization to receive and dispose of such waste. The Division's final inspection shall include a determination that the following items have been completed satisfactorily:

    - The initial portions of the Containerized LLRW Disposal Embankment has been constructed in conformance with the design and construction specifications container in the Application for License Amendment and the "LLRW Embankment Construction Project Plan."
    - Support facilities have been constructed in conformance with the design and construction specifications of the Application for License Amendment.
    - All necessary Containerized LLRW Operating Procedures have been prepared and approved.

- The necessary operations personnel, as defined in the License Application, have been employed. All facility personnel have satisfactorily completed the Licensee's training program and all training has been documented.
- Record keeping systems for waste receipt, shipping manifests, waste disposal activities, environmental monitoring and financial records have been developed and implemented. A data management system for environmental monitoring and surveillance data has been developed and implemented.
- Other necessary actions identified by the UDRC have been satisfactorily completed.

**CONSTRUCTION DRAWINGS**

63. The Licensee shall, no later than March 31 of each year, provide a comprehensive set of drawings of the Containerized LLRW Disposal Embankment and related features showing "as- built" conditions as they existed at December 31 of the preceding year. The drawings shall correctly: (1) locate all structures, utilities, fences, ponds, drainage features railroad tracks, roads, storage facilities, loading and off-loading facilities, disposal embankments, all environmental monitoring locations including instruments/devices, and any other appurtenances related to containerized LLRW disposal operations, maintenance and closure of the disposal facility; and (2) provide structural details including site elevation. A directory shall be included that identifies drawings by discrete number, title, date and revision.

64. Drawings showing approved future designs, shall be marked as "Record Drawings." Record drawings or construction drawings shall be certified by a Utah registered professional engineer.

**OPERATING PROCEDURES FOR CONTAINERIZED LLRW EMBANKMENT**

65. The Licensee shall not dispose of any damaged waste container in the Containerized LLRW Disposal Embankment without first repairing the damaged container or overpacking it in an undamaged container. The concrete overpack alone cannot be relied upon for the purpose of satisfying this Condition.

    - The Licensee is not authorized to open any packages at its facility, except for the purposes of:
    - Repairing or repackaging damaged containers.
    - Inspecting to insure compliance with this license.
    - Returning outer shipping containers.
    - Confirming package contents.

66. The Licensee shall handle and emplace LLRW packages in embankment such that packaging integrity is maintained during handling, emplacing, and subsequent backfilling. Waste packages deposited in embankment shall be protected from any adverse effects of operations which may damage them.

    - Whenever the Licensee suspects any waste container of containing void spaces that have not been reduced to the maximum extent possible, or whenever the Licensee verifies that the void space percentage is greater than five percent of the container's volume, the Licensee shall place the container on hold until the non-conformance can be resolved, and shall notify the Division of Radiation Control within 24 hours of identification of the suspect container.

    - The Licensee shall be a "Registered User" of all licensed casks delivered to the site that contain LLRW for disposal. Prior to receiving Type B cask shipments, the Licensee shall develop and implement an NRC-approved transportation and quality assurance program in accordance with 10 CFR 71.

    - Prior to accepting large radioactive components for disposal in the Containerized LLRW Disposal Embankment, the Licensee shall provide an operations safety plan to the Division of Radiation Control for review and approval.

The safety plan shall contain calculations of the bearing load that the in-place component(s) will exert on the foundation of the embankment, the settlement expected, and the expected effects on cover integrity. The calculations shall indicate that a safety factor of 3.0 or greater will be achieved with respect to the soil bearing capacity.

- Class B and Class C LLRW shall be disposed of only in concrete overpacks defined in Sections 4.1.2, 4.2.2, and 4.2.3 and Drawing 99150-C-001 of the Application for License Amendment dated December 13, 2000.

- Structural evaluations for large components may be submitted to the Division for review and with concurrence from the Division will not require disposal in the concrete overpack required in Condition 71.

- Concrete overpacks used for Class B and C wastes shall be placed beneath the crest of the top slope portion of the embankment cover. Individual overpack boxes shall be of the design shown on Drawing 99150-C-001. Overpacks shall be stacked no more than two (2) high. The base of any overpack shall be emplaced such that the final depth of the overpack not exceed 40 feet below the projected final elevation of the top of the finished embankment cover at its location in the emplacement. The elevation of the lid of any overpack placed singly (i.e., not stacked) within the embankment shall not be more than 20 feet below the projected final elevation of the top of the finished cover at the emplacement location.

67. Waste placement and backfilling shall be conducted in accordance with the following:

- Wastes designated as Class C shall be disposed so that the top of the waste is a minimum of 5 meters below the top surface of the finished cover.

- Class A Unstable wastes shall be segregated from Class B/C overpacks by the Transition Zone.

- The Licensee shall construct a Transition Zone to segregate Class A Unstable waste containers from concrete overpacks containing Class B and/or Class C in the "stair step" manner depicted on Figure 4-3 of the :Licensee's "Application for License Amendment" dated December 13, 2000 (or the most recent approved revision thereof). The Licensee shall ensure that the top layer of Class A Unstable waste containers is separated from the nearest concrete overpack by at least 10 feet. Proceeding from the top layer of Class A Unstable waste containers to the bottom layer, the Licensee shall ensure that each successive layer of Class A Unstable waste containers is offset 15 additional feet from the offset of the previous layer.

- Class A Stable waste and associated backfill may be placed: (1) beneath Class B/C overpacks; (2) above the top of Class B/C overpacks; (3) within the Transition Zone between Class A Unstable waste and concrete overpacks; and/or (4) commingled with Class A Unstable wastes.

- The Transition Zone shall not contain more than 25 percent (by volume) Class A Stable waste containers, with compacted soil comprising the remainder of the Transition Zone volume. Class A Stable waste containers shall be placed not to exceed one row per layer within the Transition Zone, and each layer of Class A Stable waste containers placed within the Transition Zone shall occupy a minimum surface area of 400 square feet.

- The Licensee shall place and compact backfill between Class A Stable waste containers in the Transition Zone to achieve the specifications contained in the LLRW Embankment Construction Project Plan, under Work Element- "Waste Placement," Specification "Transition Zone Placement." Soils used for constructing the remainder of the Transition Zone shall be classified as CL or CL-ML soils by the Unified Soils Classification System (ASTM D-2487) and shall be placed to meet a minimum average compaction density of 95 percent of the standard proctor density with a moisture content between 2 percent and 3 percent above the optimum moisture content for those soils. The Licensee's documentation that this minimum average required compaction density has been met shall consist, as a minimum, of test results of laboratory classification tests, moisture content testing, and Proctor density testing of the proposed Transition Zone backfill soils conducted in accordance with the most

recently approved "LLRW Embankment Construction Project Plan," "Element- Waste Placement," and documentation of the Transition Zone construction and compaction methods and procedures used during waste disposal operations.

C The Licensee shall conduct placement of Class A Stable and Class A Unstable waste and backfill placement and compaction concurrently. No more than 3 layers of drums shall be placed before backfilling commences. The height of a layer of boxes or stack of boxes shall not exceed 5 feet before backfilling commences. Waste packages shall be placed or stacked in a manner that minimizes the volume of voids between the waste drums and/or boxes. The Licensee shall emplace concrete overpacks in a manner that minimizes voids between them and permit voids between concrete overpacks to be backfilled.

C Unless otherwise approved by the Division of Radiation Control, the Licensee shall use relatively dry (i.e., # 5.4 percent moisture content) cohesionless soil to fill void spaces within the concrete overpacks, between concrete overpacks, and between all Class A waste containers. Large rocks which might block the downward flow of soil into voids will be excluded from backfill material. Backfill soil shall conform to the following specifications:

**Containerized Waste Backfill Specifications**

| Parameter | Specification |
|---|---|
| Gradation | 3/8 " sieve: 100 percent passing<br>No. 4 sieve: 100 percent passing<br>No. 10 sieve: 99 percent passing<br>No. 20 sieve: 88 percent passing<br>No. 40 sieve: 58 percent passing<br>No. 80 sieve: 25 percent passing<br>No. 200 sieve: 10 percent passing |
| Moisture Content | Less than or equal to 5.4 percent |

C Backfilling shall be done by pouring soil over a waste container or group of waste containers using the bucket on a front-end loader, or by pushing soil over packages with a dozer, in accordance with the most recently approved Class A Waste Placement and Backfilling Procedure contained in the "LLRW Operations Manual." Heavy equipment shall not be operated directly on top of the waste form and/or concrete overpack. Equipment with low ground pressure may travel directly on top of waste containers only with prior approval of the Division of Radiation Control. A soil blanket shall be placed to bring the soil depth over emplaced waste packages to a minimum of 2 feet. The surface of the backfill soil shall then be prepared to accommodate the next layer of waste packages by making multiple (at least three) passes of a D-8 bulldozer or equivalent piece of heavy equipment over the backfill soil layer prior to placing the next layer of waste packages. The backfilling procedure may be varied according to the results obtained from one or more "Waste Placement Test Pad(s)" constructed in accordance with the "LLRW Embankment Construction Project Plan," with the prior concurrence of the Division of Radiation Control.

C An average backfill densification of at least 90 percent relative compaction shall be achieved for backfill placed around and between Class A Unstable waste drums and an average backfill densification of at least 85 percent relative compaction shall be achieved for backfill placed around and between Class A Unstable waste boxes. The Licensee shall document that these minimum required densities have been met with, at a minimum, test results of gradation and moisture content testing of the backfill materials (conducted in accordance with the most recently approved "LLRW Embankment Construction Project Plan") and documentation that the backfill placement and compaction procedures used during waste disposal operations matched those used during construction of the Waste Placement Test Pad(s)" also constructed in accordance with that "LLRW Embankment Construction Project Plan."

- Unusually shaped packages shall be placed and backfilled in a manner that allows voids to be filled. In no case shall packages be placed such that a significant amount of void space cannot be filled. A significant amount of void space is 5 percent of the volume of the unusually shaped package, unless otherwise approved by the Division.

- Decomposable materials (e.g., framing lumber used for bracing waste packages in transportation conveyances) which are to be discarded into the disposal embankment shall be placed in small stacks near the bottom of a layer of waste packages. Decomposable materials shall not be accumulated into large piles for placement.

- The Licensee shall initiate closure and stabilization measures as a well-defined portion of the Containerized LLRW Disposal Embankment is filled and covered. Final grades shall be established at no more than one year following final disposal operations for that portion of the embankment. Completed portions of the embankment shall be continuously and properly maintained to control erosion. Active waste disposal operations shall not have an adverse effect on the completed closure and stabilization measures.

- The Licensee shall fulfill and maintain compliance with all conditions and requirements as contained in the "LLRW Operations Manual," dated November 15, 2000, or more recent revision as approved by the Division.

- Access to truck, railcar, and other equipment washdown (decontamination) facilities, including evaporation ponds, shall be controlled with fences or other approved barriers to prevent unauthorized entry.

- The Containerized LLRW Disposal Embankments and associated waste storage areas, including immediately adjacent drainage structures, shall be controlled areas, surrounded by a six foot (6') high, chain link fence. All permanent fences shall be chain link, six feet (6') high, topped with three strand barbed wire, top tension wire and twisted selvedge.

**FINANCIAL ASSURANCE/CLOSURE**

68. The Licensee shall maintain a Surety that satisfies the requirements of UAC R313-25-31 in an amount adequate to fund the decommissioning and reclamation of Licensees' grounds, equipment and facilities by an independent contractor. The Licensee shall annually review the amount of surety and submit a report of its findings to the Executive Secretary by August 31 each year. The Executive Secretary shall annually determine the required amount of surety under the Surety and shall require the Licensee to adjust the surety as necessary to reflect any increase in decommissioning and reclamation costs.

69. One (1) year prior to the anticipated closure of the site, the Licensee shall submit for review and approval by the Executive Secretary a site decontamination and decommissioning plan. As part of this plan, the Licensee shall demonstrate by measurements and/or modeling that concentrations of radioactive materials which may be released to the general environment, after site closure, will not result in an annual dose exceeding 25 millirems to the whole body, 75 millirems to the thyroid, and 25 millirems to any other organ of any member of the public.

70. In accordance with UAC R313-25-33(6), the Licensee shall submit a financial report or certified financial statement annually by March31st of each year for the previous year.

71. Except as specifically provided otherwise in this license, the Licensee shall conduct its program in accordance with the statements, representations, and procedures contained in the documents listed below, including any enclosures, attachments, appendices. The Utah Radiation Control Rules, Utah Administrative Code R313 shall govern unless the statements, representations, and procedures in the Licensee's application and correspondence are more restrictive than the rules.

- Application for License Amendment, dated December 13, 2000.

**UTAH RADIATION CONTROL BOARD**

William J. Sinclair, Executive Secretary

Date